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EXAMINER

SONG, JASMINE

ART UNIT	PAPER NUMBER
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2188

DATE MAILED: 02/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/915,024

Applicant(s)

HUSTED ET AL.

Examiner

Jasmine Song

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 01 December 2003.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-19 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 25 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

## **Detailed Action**

1. This office action is in response to Amendment A, mailed 12/01/2003, paper #5. Claims 1-19 are still pending. All rejections and objections not explicitly repeated below are withdrawn.

## **Specification**

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

## **Claim Rejections - 35 USC § 103**

3. The rejection of claims 1-19 under 35 U.S.C. 103(a) as being unpatentable are maintained and updated as shown below.
4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmidt et al., U.S. Patent 5,212,631, in view of Sharma et al., U.S. Patent 6,085,263.

Regarding claims 1,6 and 9, Schmidt teaches that a programmable control system, comprising:

a processor (Fig.2, General purpose processor 60) for executing a control program (col.3, lines 63-66 and col.4, lines 33-34); a shared memory (Fig.2, shared system RAM 36) storing data associated with the control program, at least one of data associated with sensing and actuating devices (col.3, lines 63 –68; col.5, lines 58-62 and Fig.3, col.5, lines 32-39), and forced I/O values (Fig.3); and

an I/O processor (Fig.2 or Fig.4, the ladder logic processor 50) for performing at least one of input and output functions (Fig.4), the I/O processor and the processor operatively coupled to the shared memory (Fig.2). The I/O processor storing input values in the shared memory and determining output value based at least in part upon forced I/O values (utilizing the infrequently changed data) stored in the shared memory (col.6, lines 50 to col.7, lines 39).

Schmidt does not teach that the I/O processor operatively coupled to a cache memory storing at least a portion of the forced I/O values stored in the shared memory, therefore, storing input values in the shared memory and determining output value based at least in part upon forced I/O values stored in the cache memory.

However, Sharma teaches that the I/O processor operatively coupled to a cache memory storing at least a portion of the forced I/O values stored in the shared memory (as shown in Fig.1, IOP 800 includes the cache 820 storing the data prefetched from the

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shared memory 150, therefore, storing the data in the shared memory and determining output value are based on the prefetched data within the cache memory) (col.14, lines 9-37).

It would have been obvious to the ordinary skill in the art at the time the invention was made to utilize the teachings of Sharma such as having a cache storing the portion of data from the shared memory because this feature improves overall performance of the system (col14, lines 38-47) since the prefetched data is already in the cache memory and does not need to be retrieved from the slow shared memory.

According, one of ordinary skill in the art would have recognized this and concluded that they are from the same field of endeavor (for example: I/O processor includes the cache memory). This would have motivated one of ordinary skill in the art to implement the above combination for the advantages set forth above.

Regarding claims 10,12,15-17 and 19, Schmidt teaches that a method for forcing an I/O values in an industrial control environment, comprising:

receiving information associated with an input from a sensing device; retrieving information associated with an output to an actuating device (col.3, lines 63 –68; col.5, lines 58-62 and Fig.3, col.5, lines 32-39);

Schmidt does not teach that loading a cache with forcing information associated with a forced input or output and forcing the input or output based at least in part upon the forcing information loaded in the cache.

However, Sharma teaches that the I/O processor operatively coupled to a cache memory storing at least a portion of the forced I/O values stored in the shared memory (as shown in Fig.1, IOP 800 includes the cache 820 storing the data prefetched from the shared memory 150, therefore, storing the data in the shared memory and determining output value are based on the prefetched data within the cache memory) (col.14, lines 9-37).

It would have been obvious to the ordinary skill in the art at the time the invention was made to utilize the teachings of Sharma such as having a cache storing the portion of data from the shared memory because this feature improves overall performance of the system (col14, lines 38-47) since the prefetched data is already in the cache memory and does not need to be retrieved from the slow shared memory.

According, one of ordinary skill in the art would have recognized this and concluded that they are from the same field of endeavor (for example: I/O processor includes the cache memory). This would have motivated one of ordinary skill in the art to implement the above combination for the advantages set forth above.

Regarding claims 2-3,8,11,13-14 and 18, Sharma teaches that the processor sending a message to the I/O processor in the event a forced I/O value (the infrequently changed data) has been altered during execution of the control program, the I/O processor causing the cache memory to be refreshed by performing a blocked write in response to receipt of the message. It would have been obvious to the ordinary skill in the art at the time the invention was made to utilize the teachings of Sharma

such as I/O processor perform a blocked write to refresh the cache memory in response to the altered I/O value caused by the processor in order to maintain the consistency among the caches of the IOP and processors (col.7, lines 10-39).

Regarding claim 4, Schmidt teaches that the forced I/O values comprising at least one of binary and analog values (col.6, lines 19-21).

Regarding claim 5, Schmidt teaches that the processor and I/O processing being coupled by at least one of a serial communications backplane bus, a parallel communications backplane bus and a network (Fig.2, first and second network interfaces and col.4, lines 1-4).

Regarding claim 7, Schmidt teaches that the infrequently changed data being at least one of I/O force data, configuration data, I/O fail safe information, a connection table, an output keep alive table and information associated with an input time-out (Fig.3).

### **Response to Arguments**

6. Applicant's arguments filed 12/01/2003 have been fully considered but they are not persuasive.

In response to applicant's argument that neither Schmidt or Sharma teach or suggest the claimed invention "the I/O processor operatively coupled to a cache

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memory storing at least a portion of the forced I/O values stored in the shared memory, the I/O processor both stores input values in the shared memory based at least in part upon forced I/O values stored in the cache memory, as well as utilizing in part the forced I/O values stored in cache memory to determine output values", however, it is noted that the above limitations are taught by Schmidt and Sharma, please refer to the 103(a) rejections as shown above. Further, applicant must discuss the references applied against the claims (specifically, the claimed language), explaining how the claims or claim language avoid the references or distinguish from them, however, the arguments on page 8-9 have only generic statement regarding the reference without specifically addressing the points set-forth in the examiner's rejection.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by



combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the combination of Schmidt and Sharma teaches the claimed invention and it would have been obvious to the ordinary skill in the art at the time the invention was made to utilize the teachings of Sharma such as having a cache storing the portion of data from the shared memory because this feature improves overall performance of the system (col14, lines 38-47) since the prefetched data is already in the cache memory and does not need to be retrieved from the slow shared memory. According, one of ordinary skill in the art would have recognized this and concluded that they are from the same field of endeavor (for example: I/O processor includes the cache memory). This would have motivated one of ordinary skill in the art to implement the above combination for the advantages set forth above.

### **Conclusion**

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. When responding to the office action, Applicant is advised to clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited or the objections made. He or she must also show how the amendments avoid such references or objections. See 37 C.F.R. 1.111 (c).

9. When responding to the office action, Applicants are advised to provide the examiner with the line numbers and page numbers in the application and/or references cited to assist examiner to locate the appropriate paragraphs.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jasmine Song whose telephone number is 703-305-7701. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mano Padmanabhan can be reached on 703-306-2903. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Jasmine Song



Patent Examiner

February 19, 2004



Mano Padmanabhan

Supervisory Patent Examiner

Technology Center 2100